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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,456	01/03/2006	William S Oakley	NSS1P003.US01	8042
45965	7590	04/28/2010	EXAMINER	
TIPS GROUP			ORTIZ CRIADO, JORGE L	
c/o Intellevate LLC				
P. O. BOX 52050			ART UNIT	PAPER NUMBER
Minneapolis, MN 55402			2627	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,456	Applicant(s) OAKLEY, WILLIAM S	
	Examiner JORGE L. ORTIZ CRIADO	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 10-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 10-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 16 recites the limitation of "wherein the carbon nanotubes of the array of carbon nanotubes share a single housing among all carbon nanotubes of the array of carbon nanotubes".

The examiner cannot ascertain where in the specification description and support for this limitations is found. This limitation is considered new matter added to the disclosure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 10, 11, 14-16, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crewe U.S. Patent No. 4,760,567 in combination with Nickel U.S. Patent Application Publication 2003/0007443 or Jin U.S. Pat. No. 7,068,582; further in combination with Ikeda et al. U.S. Patent No. 4,817,053, and further in view of Redlich et al. U.S. Pat. No. 3,737,589.

Regarding claim 1, Crewe discloses an apparatus, comprising: an array of electron beam tube cathode heads; and a base (38) upon which the array heads are mounted.

each of the heads including:

a filament, (58) and a tip (60), (as the electron beam source),

a housing surrounding the tube head (72, 74, 76 and 86),

an acceleration electrode mounted at an end of the housing (70),

a deflection member (84) interposed between the acceleration electrode and a tip (60; electron beam source) (fig. 2),

a window (provided by 70 and 82) sealing the end of the housing;

The apparatus of Crewe and the claimed apparatus differ in that Crewe teaches a filament mounted on a base, a tip on the filament, whereas the claimed invention claims a substrate upon which the array of carbon nanotube heads are mounted, that the deflection member is claimed as a deflection electrode and a detection electrode mounted on a surface of the window.

Crewe discloses and has the desirability of using the electron beam emission cathodes for obtaining a high ultra compact and high density data storage.

However, in a similar field of the art directed towards electron emission for data storage/retrieval, Nickel disclose an apparatus for data storage having an array of carbon nanotubes, a substrate and a carbon nanotube upon which the array of carbon nanotubes are mounted. And/or Jin discloses a substrate (Fig. 2: see upside-down-U-shaped platform on which 21 is mounted); and a carbon nanotube (Fig. 2: element 21; also see col. 4, lines 35-36) on the substrate.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to substitute the tip and filament of the apparatus of Crewe with the carbon nanotube and substrate of Jin or Nickel, such that the substrate is mounted on the base (38) of Crewe, and to direct emissions of the carbon nanotube. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to use another well-known means for producing an electron beam, using the carbon nanotubes as the electron beam source since in order to provide a higher electron beam directionality that results in an electron beam having increased focus and accuracy, which allows bit size to be reduced, hence by reducing the bit size increases storage density and reduces storage cost. Furthermore, the nanotubes also have a lower material transfer and lower transfer rate increases the effective life of the electron sources.

In addition, the modified apparatus of Crewe in view of Jin or Nickel above, does not expressly disclose a detection electrode mounted on a surface of the window.

However, in a similar field of endeavor, Ikeda discloses a detector (Fig. 2, element 8) mounted on an end of a housing (5), the detection electrode to detect electrons reflected (7) from a recording medium (col. 4, lines 18-40).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to incorporate and mount a detection electrode as taught by Ikeda into the apparatus of Crewe. One of ordinary skill in the art at the time of the applicant's invention would have been motivated to be able detect, and thus read information from a recording medium (col. 4, lines 18-40).

Further, in the same field of endeavor the use of a deflecting member for provision of the same function and purpose of the member (38) of Crewe, that enable the beam to be scanned or positioned radially as desired as deflection electrode is well known as evidenced by For example Redlich et al., which discloses electrostatic deflection electrode (7) (Fig. 3) that enable the beam to be scanned or positioned radially as desired.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to incorporate and mount a deflection electrode facilitating and simplifying the positioning of the beam, making the heads smaller and compact.

In regard to claim 2, the combination as outlined above shows that the array of carbon nanotube heads would includes a set (18; 20) of read/write heads (see Crewe).

In regard to claim 3, the combination as outlined above shows that the array of carbon nanotube heads includes independent controls (21,22,23) for each carbon nanotube head (see Crewe).

As per claim 10, the combination as outlined above shows a gating electrode (66 of Crewe).

As per claim 11, the combination as outlined above shows a focus electrode (68 of Crewe).

As per claim 14, the combination as outlined above shows where the substrate is mounted on a base (38 of Crewe).

As per claim 15, the combination as outlined above shows that the carbon nanotubes of the array of carbon nanotubes each have individual housings associated therewith.

As per claim 16, although in light of the specification is not clear how or when description is made regarding "sharing" a single housing among all carbon nanotubes, the above combination would teach for sharing a single vacuum environment among all the nanotubes (see Crewe or Ikeda et al.

Claim 18 and 21, recites limitations similar to the ones treated in the above rejections and are rejected for the same reasons of obviousness as used above.

Claims 12, 13, 17, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crewe U.S. Patent No. 4,760,567 in combination with Nickel U.S. Patent Application Publication 2003/0007443 or Jin U.S. Pat. No. 7,068,582; further in combination with Ikeda et al. U.S. Patent No. 4,817,053, and Redlich et al. U.S. Pat. No. 3,737,589, and/or further in view of Nagai et al. U.S. Patent No. 5,227,700.

As per claims 12, where in the housing is a vacuum housing (Crewe entire system is at vacuum) hence the housing is vacuum as well. Whether the claimed invention I intended to refer to provide such vacuum only at the housing portion would be an obvious alternative variation

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which would require routine skill in the art. In the alternative claim 12 is rejected as further in view of Nagai et al. discloses such configuration of a housing (10) head enclosing the components such the electron beam source, electrodes etc. at vacuum. It would have been obvious to one of an ordinary skill in the art to implement such alternative arrangement that provides such sealed environment, desirable in the field of endeavor.

As per claim 13, would differentiate from the combination above in that the material for the window is specified (boron nitride), further differentiating from the element 70 + 82 as in the rationale above, where the window could be interpreted as integrated or as a separated and mounted together. For the same reasons as outlined in claim 12 and in view of Nagai et al., the provision of such window (element 5) would provide the vacuum at the housing and it would have been obvious to one of an ordinary skill in the art to implement such alternative arrangement. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select boron nitride material or any other suitable material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Claim 17, 19, 20 and 22, recites limitations similar to the ones treated in the above rejections, and are rejected for the same reasons of obviousness as used above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JORGE L. ORTIZ CRIADO whose telephone number is (571)272-7624. The examiner can normally be reached on Mon.-Fri 10:00 am- 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea L. Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jorge L Ortiz-Criado/
Primary Examiner, Art Unit 2627